IN THE CLAIMS:

Please enter the amendments shown in the claim listing below, which replaces all previous claim listings.

1-10. (Cancelled)

11. (Currently Amended) A chemical reactor system for generation of high purity gas, comprised of a source of microwave radiation, a microwave transparent, gas tight barrier, a microwave reflecting enclosure into which said source of microwave radiation is directed through said gas tight barrier and into a reaction zone within said microwave reflecting enclosure, a manifold for gas delivery adapted to receive generated gas from said enclosure, a solvent vapor removal device adapted to remove solvent vapor from the generated gas, a gas concentration sensor for sensing gas concentration in the generated gas, a feed-back control system adapted to control gas generation rate in said enclosure, and a supply vessel for containing a precursor material for forming said gas, said supply vessel fluidly connected to said reaction zone for feed of the precursor material to the reaction zone to generate the high purity gas, and wherein said system is configured to generate said high purity gas containing no more than 100 parts per million of water vapor.

12. (Original) The system of Claim 11, wherein the microwave radiation source has a frequency of 0.9 GHz, or 2.41 to 10 GHz.

13. (Previously Amended) The system of Claim 11, wherein the microwave transparent barrier comprises a material selected from the group consisting of a tetrafluoroethylene polymer resin, fused silica, silicon dioxide, boron nitride, or graphite.

14. (Previously Amended) The system of Claim 11, wherein the microwave reflecting enclosure is constructed from an electrically conductive material with a conductivity of a least 10^{-3} ohm/cm.

15. (Original) The system of Claim 11, wherein the microwave reflecting enclosure has a smallest dimension of at least twice the wavelength of the microwave radiation.

16. (Previously Amended) The system of Claim 11 and also comprising a precursor material received in said supply vessel, and wherein the precursor material is selected from the group consisting of hypophosphorous acid, hypophosphoric acid, and an alkaline slurry of red phosphorous.

17. (Original) The system of Claim 11 wherein the vapor removal device contains silica gel.

18. (Previously Amended) The system of Claim 11, wherein the feedback control system includes a microprocessor controlled temperature feedback loop to a raw material feed pump, and a microwave radiation source power supply.

19. (Previously Amended) The system of Claim 11 wherein the feedback control system is adapted to modulate the electrical power to the microwave radiation source to maintain a constant gas delivery pressure.

20. (Previously Amended) The system of Claim 11 wherein the feedback control system is adapted to modulate the electrical power to the microwave radiation source to provide a variable gas flow rate.

21. (Previously Amended) The system of Claim 11 wherein the feedback control system is adapted to modulate the microwave radiation frequency to control the reaction product selectivity.

22-31. (Cancelled)

32. (Currently Amended) A chemical reactor system for generation of high purity gas for semiconductor fabrication, comprised of:

a source of microwave radiation;

a reaction chamber for receiving a precursor material for generating said gas, said reaction chamber adapted to generate said gas under pressure;

a microwave transparent, gas tight barrier through which said source of microwave radiation is directed into said reaction chamber;

a microwave reflecting enclosure into which said source of microwave radiation is directed;

a manifold for gas delivery adapted to receive the generated gas;

a gas concentration sensor for sensing gas concentration in the generated gas; ~~and~~

a solvent vapor removal device adapted to remove solvent vapor from the generated gas; and

wherein said system is configured to generate said high purity gas containing no more than 100 parts per million of water vapor.

33. (Original) The system of claim 32, also comprising a supply of precursor material coupled to said reaction chamber.

34. (Previously Amended) The system of claim 33, also comprising:

a feed-back control system to control gas generation rate in said reaction chamber.

35. (Previously submitted) The system of claim 32, also comprising a semiconductor fabrication device fluidly coupled to said manifold for delivery of the generated gas to the semiconductor fabrication device.

36. (Previously submitted) The system of claim 35, wherein said semiconductor fabrication device is a chemical vapor deposition reactor or an oxidation furnace.

37. (Previously submitted) The system of claim 32, also comprising a precursor material for generating said gas received within said reaction chamber.

38. (Currently Amended) The system of claim 32, also comprising a supply vessel for containing a liquid precursor material, and a pump fluidly coupled to said supply vessel and operable to pump the liquid precursor material from the supply vessel to the reaction chamber.~~configured to generate said high purity gas containing no more than 100 parts per million of water vapor.~~

39. (Previously submitted) The system of claim 37, wherein said precursor material is suitable for generating phosphine gas.

40. (Previously submitted) The system of claim 37, also comprising a liquid received in said reaction chamber for absorbing microwave radiation directed into said reaction chamber.

41. (Currently Amended) A chemical reactor system for generation of a gas, comprised of:

a source of microwave radiation;

a reaction chamber for receiving a precursor material for generating said gas, said reaction chamber adapted to generate said gas under pressure;

a microwave transparent, gas tight barrier through which said source of microwave radiation is directed into said reaction chamber;

a microwave reflecting enclosure into which said source of microwave radiation is directed;

a manifold for gas delivery adapted to receive the generated gas;

a solvent vapor removal device adapted to remove solvent vapor from the generated gas; ~~and~~

a supply vessel fluidly connected to said reaction chamber and adapted to feed the precursor material to the reaction chamber for generation of said gas; and

wherein said system is configured to generate said gas containing no more than 100 parts per million of water vapor.

42. (Previously Submitted) The system of claim 41, wherein said reaction chamber is further adapted to permit reflux of a liquid precursor material during generation of said gas.

43. (Previously Submitted) The system of claim 41, also comprising a gas concentration sensor for sensing gas concentration in the generated gas.

44. (Previously Amended) The system of claim 41, also comprising the precursor material received in said supply vessel, and wherein the precursor material is selected from the group consisting of hypophosphorous acid, hypophosphoric acid, and an alkaline slurry of red phosphorous.

45. (Currently Amended) The system of claim ~~45~~41, also comprising a source of diluent gas fluidly coupled to said manifold for mixing a diluent gas with the generated gas.

46. (Previously Submitted) The system of claim 45, also comprising a diluent gas mass flow controller operably associated with said source of diluent gas, and a feed-back control system operable to control said mass flow controller to modulate the volume of diluent gas mixed with the generated gas in response to a generated gas concentration signal from said gas concentration sensor.

47. (Previously Submitted) The system of claim 41, wherein said reaction chamber is defined within a first microwave transparent tube concentrically surrounded by a second microwave transparent tube, wherein said second microwave transparent tube is capable of withstanding higher pressures than said first microwave transparent tube.

48. (Previously Submitted) The system of claim 41, wherein said reaction chamber is defined within a steel vessel having a microwave transparent window mounted thereon.

49. (Previously Submitted) The system of claim 41, wherein said reaction chamber has a first portion into which said source of microwave radiation is directed, a second portion below said first portion for receiving the precursor material from the supply vessel, and a third portion above the first portion and operable to receive overflow of refluxing reaction products from the first portion.

50. (Previously Submitted) The system of claim 41, also comprising a pump fluidly coupled to said supply vessel and operable to drive a precursor material from the supply vessel to the reaction chamber at a constant rate.